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Combat Crew

strategic air command

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NOVEMBER 1981

BOMB/NAV '81

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Combat Crew

Magazine of the Strategic Air Command - 32nd Year of Publication

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IN THIS ISSUE

Bomb/Nav Competition 2
Dealing Within 8
ICBM Command & Control 10
BIG "I" 16
Robins' Winners 18
CFIC Corner 26

ON THE COVER

Tribute To Bomb/Nav Competition '81

SACRP 127-1 VOL. XXXI NO. 11 NOVEMBER 1981

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Barksdale Hosts . . .

1981 Bomb Nav Competition

SAC's 1981 Bombing and Navigation Competition will be the 25th held by the command, according to Lt. Col George Ward project officer. He reports, "This year's competition will be an all SAC affair. TAC could not participate due to operational commitments, and the RAF is converting from Vulcan aircraft to their new bomber, the Tornado. Also, the RAAF is hosting a major exercise during November and have reported they plan to compete only every other year."

Plans for this year's competition began in December 1980 with a review of unit critiques. A concept was then developed and CINCSAC approval was obtained to hold a 1981 competition. Shortly after approval was granted, ICEVG route development began plans to establish routing. Additionally, bomber and tanker mission requirements were established to achieve the stated objectives. In April 1981 CINCSAC was briefed on the entire bomb-comp package. This briefing was followed by publication of the operations order, an OAP conference and preparation of target materials.

Between May and September, units began and completed their selection of aircrews and plans were formalized for the symposium at Barksdale. The FAA controllers' action necessitated an early September conference to restructure the competition. Basically, the restructuring required increased spacing between aircraft (bombers and tankers),

flying over a greater number of days and/or nights and eliminating the air refueling requirement as a scored area.

The flying phase of the competition ends 2-10 November 1981 with the actual competition missions, but the 1981 Bomb-Nav Competition will close at Barksdale with a symposium 16-18 November 1981. Approximately 1200 civilians and military personnel will convene upon the Shreveport-Bossier City area to attend the various symposium events. During the day of 16 November, competitors and distinguished visitors will arrive in time for the score posting that evening. It is during the posting that units find out for the first time their point totals and standing for the various awards.

On the morning of the 17th, a symposium will be held with separate programs for civilians, aircrew members and maintenance personnel. The programs are informative and include remarks by CINCSAC to the aircrews, maintenance and civilian personnel. There will also be static aircraft and contractor displays available during the symposium.

The symposium concludes on Wednesday morning with formal awards ceremonies followed immediately by departures of guests.

For most, Bomb Comp 81 becomes past history after departure. However, the post competition analysis committee convenes and prepares an analysis of all activity. Once this is published the loop is complete until the critiques are received and planning for the 1982 competition begins again.

The first SAC Bombing Competition was held at Castle in June 1948 with the goal to improve bombing accuracy and enhance esprit de corps. Ten B-29 groups participated. Convinced of the success of the previous year, the competition was expanded in 1949 to include B-36, B-29 and B-50 aircraft. These first two competitions were strictly devoted to high altitude bombing.

The competition was canceled in 1950 due to the Korean war but resumed again in 1951. That year a navigation phase was added which included three night celestial legs. This was also the first year the Royal Air Force participated in the exercise with two RAF crews flying standard B-29s. The fifth competition in 1953 saw the first B-47 participation, the first all jet bomber, and in 1956 the eighth competition saw the first B-52. In 1956, B-36s competed against the B-47s and B-52s and came away with top honors. In 1957, the RAF, after an absence of several years, again competed, this time with two Vulcan and Valiant aircraft. The following year, 1958, saw the final appearance of the B-36 during this the 10th competition. The 11th competition in 1959 was the largest held to that date and included for the first time both KC-97s and -135s and next year, in 1960, we saw the first B-58 participation. In 1961, the competition was expanded to include bombing, navigation, ECM and air refueling.

The competition was then canceled for three years and resumed again in 1965. This 14th competition marked the last of the B-47s. In 1970 the new FB-111 entered the event for the first time. This year was also the first time the Fairchild Trophy was to be awarded to a SAC bomber/tanker collocated unit based on a combination of bombing, ECM and navigation for bombers and tankers.

In 1974, F-111s from Tactical Air Command first competed with the SAC FB-111s and 1979 marked the first participation by fighters of ADTAC. The ADTAC participation provided the bombers with a fighter intercept exercise. TAC and RAF participation continued uninterrupted through the 24th competition.

In 1980, four Royal Australian Air Force F-111Cs and aircrews competed for the first time and increased the international flavor of the competition. Also in 1980, a DBN modified B-52D from the 7th BMW entered the event. Superb DBNs results obtained helped propel that unit into first place for the Crumm Trophy, a third place finish for the Fairchild and a strong second for the Mathis Trophy.

Coping with Weather: Techniques for Crews

Captain J. A. Drago
384th AREFW, McConnell AFB

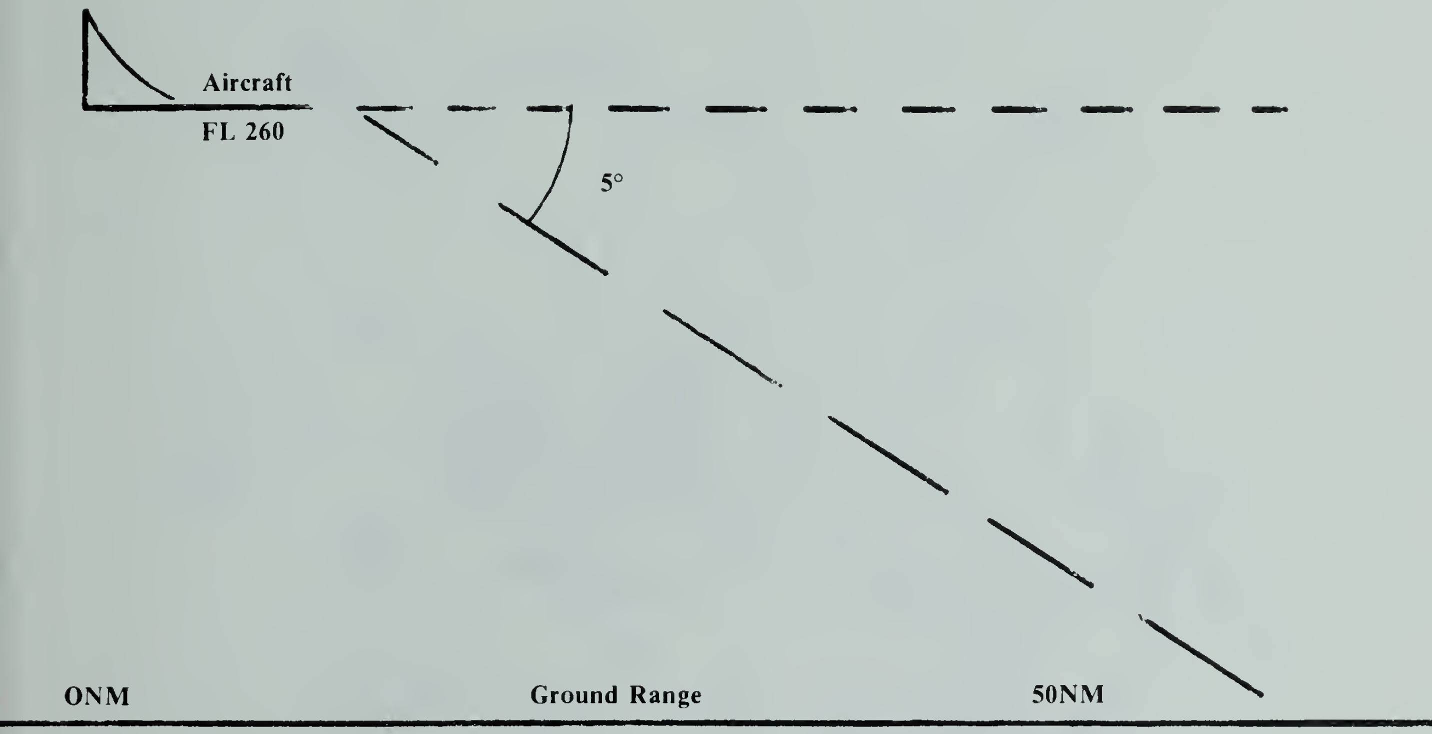
How often has it happened that you arrive in an air refueling area only to realize that weather prevents safe rendezvous operations; or weather catches you by surprise on a navigation leg and training requirements cannot be completed? When a crew has to scramble to avoid weather or hastily replan a mission while airborne, the effectiveness of training is reduced and the safe, successful completion of the mission jeopardized. Add to this the present air traffic control problem caused by the controllers' walkout, and the potential for even more serious consequences arises when route alteration becomes necessary.

The mission of SAC requires that crews know how to effectively cope with weather phenomena, especially thunderstorms. In order to reduce the negative impact of weather on flight operations, this discussion will center on some aspects crews should be aware of during mission planning: questions they should ask at weather briefings, radar techniques that are helpful in identifying hazardous weather, and rules of thumb for choosing an alternate route.

It is vitally important that flights be planned with the most current available weather information. Crews should be aware of the areas of expected hazardous weather. Further, they should stay abreast of changes in the forecast that occur between flight planning and takeoff. Whenever possible, flight activity should be planned well clear of hazardous weather areas. When this proves im-

RADAR OPERATION DEPICTION
Weather Detection Mode

Radar Settings: Range — 50NM
Pencil Beam Pattern
Tilt — set such that ground returns are just off the outer edge of the scope



Weather at, below and slightly above the aircraft will be detected

possible, the extent of the impact of the weather on the mission must be anticipated and the alternate route identified and selected. Coordination between the receiver and tanker is an essential part of the planning process.

At the weather briefing on the day of the flight, be sure that the following aspects are thoroughly covered:

- A current radar summary chart;
- Tops, intensity and coverage of storm areas;
- Probability of lightening;
- Anticipated changes in the weather picture;
- Direction/altitude to fly for safety in case severe weather is encountered;
- Current weather satellite photograph, if available.

Often weather shops are equipped with or have access to information from a radar that can search over 200 nmi. These radars can measure intensity, movement and tops of weather areas. Also, weather satellite imagery will give cloud coverage along with additional information on tops. By calling various metros along the route of flight, current radar information can be available to the crew. Further, by calling metro over UHF prior to starting engines, a crew can determine a safe departure route or perhaps save fuel by delaying engine start until a weather area passes. By asking the right questions and making use of all the equipment and information available, the crew can gain a good idea of what

Continued on Page 30

DEALING Within the UNKNOWN

CAPT JAY C. DUECHTING
91 AREFS, McConnell AFB

This isn't going to be about some technical problem, or some diagram on how to go from point A to point B, or what type of letdown and approach to use. Rather, it's going to be on the unknown. First, let me start by giving you a rundown on the sequence of events.

We went to the operations room, filed our flight plan and got our weather. I then called home station for off-base clearance, gave them all our numbers and what time I expected to be airborne. After receiving their blessing, we proceeded to the aircraft. We found maintenance personnel busily working on and around the aircraft. They had not expected us so early but they pitched in putting panels on, replacing matting upstairs, and performing inventory checks.

It became evident that we were not going to make our intended takeoff time, the crew went back to the operations offices, phoned command post, and informed them of our delay. After a short cola break, we returned to the aircraft.

It looked as though maintenance was complete and I started my exterior checklist. The remainder of the crew started up the stairs to the aircraft. As I started to put my head up into the nose compartment door opening, I quickly brought it back down again. The smell was so pungent it made my eyes water. I called for the boom to come over and smell this odor. He too brought his head out of the compartment as quickly as it went in. I turned to the maintenance personnel and they said they had just finished cleaning it. So I decided to leave the door open to clear out the smell. I sure didn't want that smell in there when we were airborne.

After pulling the ground locks, wires and tail stand, the aircraft looked as though it was in fine condition. It should be, after being pulled apart and then put together again, right? I then went to the front of the aircraft and checked the nose compartment once again. This time it was okay, so I closed the door for flight. Now for normal interior preflight. Due to a malfunction in the hydraulic system, we left the plane, due to the time limit to fix it. By this time, it was around noon, so we went to a small sandwich shop for lunch. About an hour later, we headed back to find our plane ready for flight.

Start engines and taxi were normal. We were then cleared for takeoff as a Delta 727 cleared the runway. Water injection was good, takeoff smooth, climbout uneventful. So we thought.

After we had reached our 250 KIAS for climb, I called for NRT, and the after takeoff climb checklist. That's where the problems began. The boom operator came forward and flipped the air conditioning switch on and then went to the back to do his checklist. Passing through 10,000 feet, I was having a hard time breathing, so I looked over at the cabin altimeter to see what it registered, and it appeared normal. Then I thought, I may have just been hyperventilating, so I regulated my breathing. Passing through 18,000 feet indicating 285 KIAS, I was still having a hard time breathing, so again I checked the overhead panel and cabin altimeter. They both appeared to be functioning normally. Then the copilot asked me, if I was having problems breathing? I looked at him with amazement and replied yes, how did he know? He immediately responded that he too was having a hard time breathing, and that he had noticed me looking at the cabin altimeter. We had already been cleared to our final altitude of flight, that's when I directed the copilot to ask center for an intermediate leveloff altitude of FL250 for notification of pressurization problems. I then directed everyone to go to 100% oxygen. Everyone on, the copilot then announced over the intercom that the oxygen quantity was dropping fast. I had everyone check their systems for leaks and directed the boom operator to use a portable bottle, and to check all regulators in the back. He reported from the aft station that all were fine. Then pressure started to fall in everyone's regulators. (Still, no problem, we just switch over to the gaseous system and press on with the flight at 25,000 feet, gas permitting, to get us to our destination with reserves enough for weather divert, if need be, right?)

With the boom back up front, the copilot checked to see if we could make it back home with the gas we had at that altitude. Once he said we could, we then pressed on with the problem at hand — why couldn't we breathe?

The copilot took out his Dash One and started researching the air conditioning/pressurization problem we seemed to be having. I kept looking at him every once in a while expecting him to say "Pilot, I've found the problem and I've got it fixed." But no. Instead he looks at me with this funny look and states, "I'm not sure what you're looking for, maybe you should do it."

I transferred controls to the copilot, then set about to investigate our problem. I asked the boom how the outflow was, and he reported, "Okay." I then checked the cabin manual pressure control to full increase and off. That checked good. Then I asked the boom to take his helmet and parachute and check all hatches and the APU ports. Once again he called from the back everything checked good. Now the mystery problem intensifies. My next step was to then proceed to the cabin pressure controller malfunction. As I started reading, the one thing that stuck out in my mind was that every sentence that I had read three to four times still did not make any sense to me. Within a flash (maybe two or three) I remembered that same feeling back in the altitude chamber and I slowly but assuredly gang loaded my oxygen levers to emergency and started checking for leaks.

I then checked with each individual crewmember. Each reported that it was hard for them to breathe, (even on 100% oxygen) but that they were okay. The boom had stated that he was totally unaffected so he thought and felt we were being overdramatic about the situation. Now I started feeling very uncomfortable. "I know I have a problem, but I don't know what it is." The next thing was what to do about it. The only three probabilities I felt I had at the time were: 1) to continue to home field watching the situation; 2) turn around and go back; or 3) declare an emergency and land at the nearest suitable field that had a flight surgeon.

Now I began to think along the lines that there may be a probability of a physiological problem. Who had what to eat, where, when, et cetera, but the thought was soon eliminated as we all had different lunches. Then on to the second problem of diverting a perfectly good aircraft that our base was waiting for, not to mention the crew, who had to go on alert, (what else). But probably the single most important factor would be the questioning of my decision to divert, with a code one aircraft. I could see, my newly acquired career as an aircraft commander in the Air Force over.

Continued on Page 22

ICBM COMMAND AND CONTROL COMMUNICATION INTREGRATION

Maj Daniel Clark
HQ SAC/XPQO

Bells jangle, buzzers sound, lights flash, printers whine and clunk . . ., missile crew members respond in a controlled flurry of activity. Into this arena of proliferated communications and evolving weapon systems enters the Command and Control Communications (C^3) Integration program.

Originally conceived in the mid-70's, this program was developed to ensure optimum installation of three new digital communications systems into our ICBM Launch Control Centers (LCC's). The new systems being developed by the Electronic Systems Division of Hanscom AFB MA will also be installed in soft command posts and some SAC aircraft. They include:

— The Air Force Satellite Communications System (AFSATCOM) — a new, two-way, satellite-linked, UHF system with its own typewriter-style input/output device.

— The 616A modified Survivable Low Frequency Communications System (SLFCS) — with new encryption and anti-jam capabilities for enhanced flexibility and performance in hostile environments.

— The SAC Digital Network (SACDIN) — replaces the data transmission subsystem of the SAC Automated Command and Control System (SACCS), provides high speed, two-way, secure communications to each LCC and enhances the data handling capability of the overall SACCS system.

The C^3 Integration program, under the management of the Ballistic Missile Office at Norton AFB, CA, is being accomplished in two phases. During Phase I, AFSATCOM and 616A modified SLFCS will be installed. Concurrently, all major hardware modifications will be completed for the entire C^3 program, i.e., rack relocations, power accommodations, environmental control system upgrades, etc. Full integration of digital communications will follow in Phase II when SACDIN will replace SACCS equipment in the LCCs.

Impact on Missile Combat Crews will be significant in both phases of the program. AFSATCOM will provide an entirely new communications capability between missile commanders and higher authority, changing current force status reporting procedures. While 616A modified SLFCS will remain a receive-only system, additional crew attention will be required for the new crypto and timing systems. With the installation of SACDIN in Phase II, there will be significant improvement in crew procedures:

— The two-way, secure feature will eliminate most manual coding/decoding operations.

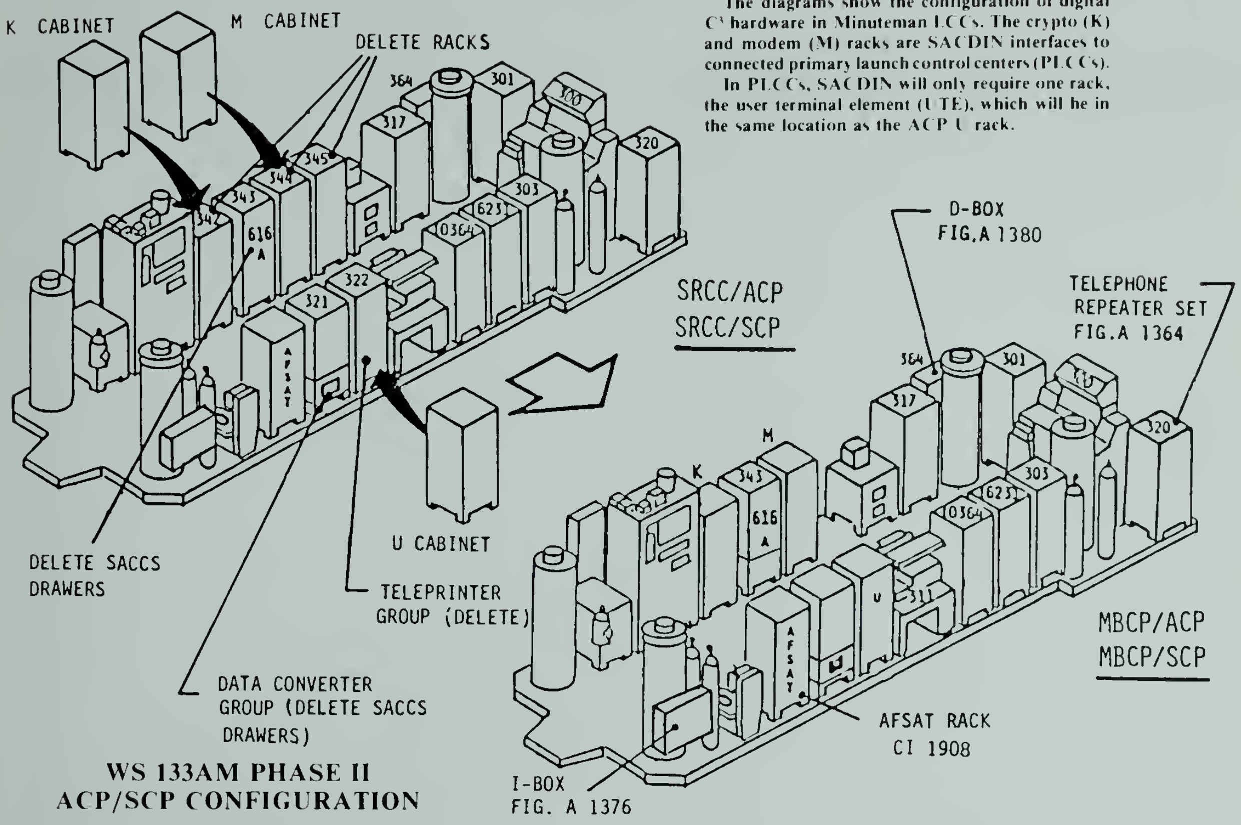
— Message composition and editing will be streamlined by a computer-assisted keyboard/printer and cathode ray tube display.

— Incoming traffic loads will be considerably reduced by the "integration" function of SACDIN, which will filter out redundant messages and silence their associated alarms.

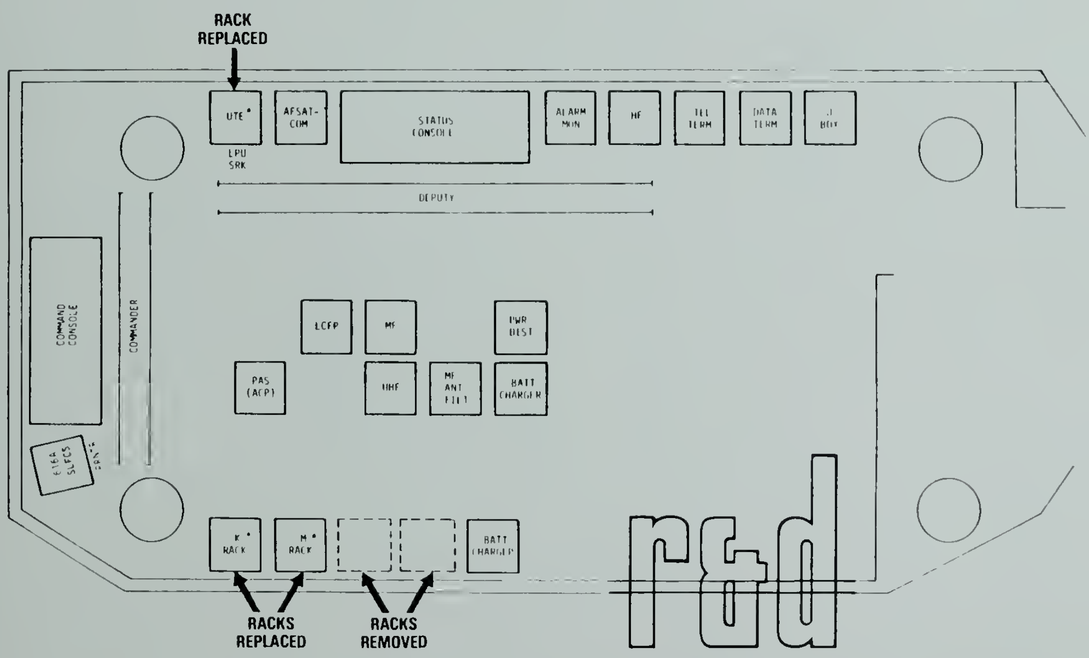
— Full trainer upgrades are planned as a part of this program to provide realistic, hands-on training for the new equipment.

Phase I deployment begins in Nov 81 at Whiteman AFB, MO followed by F. E. Warren, Minot, Ellsworth, Malmstrom and Grand Forks AFB's respectively at approximately three-month intervals. Phase II is currently in the design phase and should reach Initial Operational Capability in late CY 84. Plans have also been made for deploying these systems in TITAN II, but are currently in a hold status pending resolution of programmatic and funding issues. Further information on this program can be obtained from HQ SAC/XPQO Maj Dan Clark, AV 271-6236.

The diagrams show the configuration of digital C^3 hardware in Minuteman LCCs. The crypto (K) and modem (M) racks are SACDIN interfaces to connected primary launch control centers (PLCCs). In PLCCs, SACDIN will only require one rack, the user terminal element (UTE), which will be in the same location as the ACP U rack.



WS 133AM PHASE II
ACP/SCP CONFIGURATION



WS 133B PHASE II
ACP/SCP CONFIGURATION

r&d corner

Making Turns at TA Altitude

Capt Dan Horting
325 BMS Fairchild AFB

The night mountainous terrain avoidance operation is an ultimate test of man and machine. Terrain avoidance at night demands peak aircrew performance. Due to a reduced ability to clear the aircraft visually, this peak performance must also be obtained from the terrain avoidance system and related equipment. To obtain maximum performance from our equipment, we must deal with several TA system operating characteristics and limitations. The limited ability of TA/EVS equipment to provide terrain information for turns presents a definite problem for the aircrew.

To illustrate, let's assume that you are flying between two parallel ridge lines, each rising well above the aircraft altitude. (Figure 1) At point X, the crew will have to make a right 90° turn to point Y. The crew is flying in profile 3 to make maximum use of terrain masking. Just prior to the turn, the radar navigator advises the pilot that he will be turning into high terrain. The navigator advises that the terrain rises 3000 feet above the aircraft altitude. Given these circumstances, what climb performance is required to clear the terrain while completing the turn? By knowing groundspeed, distance to high terrain and altitude change required, the pilot can mathematically compute the climb performance required. However, many pilots have found that the intense demands of mountainous terrain avoidance operations require full attention to aircraft control — with little time for mathematical wizardry. An alternative technique for determining climb performance required for turns into high terrain involves the use of the full TA system sector. To illustrate, let's review the TA system display and apply it to the scenario presented in Figure 1. The terrain trace displays the profile of the highest terrain in a selected 3, 6, or 10 mile range in front of the aircraft, within a ± 45° sector relative to the ground track. In Figure 1, neither of the ridge lines will be present on the terrain trace with profile 3 selected. Also, the terrain may not be displayed on the EVS because of the limited horizontal viewing area of the camera. (22.4 ± 1°) However, by selecting profile 10, as shown in Figure 2, it can be seen that the TA system sector will cover the area traversed during a normal low level turn.

Due to the large turning radius of the B-52 during low level operations, the profile 10 terrain sector includes the roll out point for a 90° turn. Although the ridge lines may not be seen in the EVS, the terrain trace will display the ridge which the aircraft will be turning toward. This terrain trace can now be used to determine climb performance for the turn. By raising the nose of the aircraft to place the Horizontal Reference Line (HRL) abeam the high point on the terrain trace, vertical velocity can be checked to determine the required climb performance. (Figure 3) Note that the high terrain may not appear under the HRL, but will appear at the edge of the monitor. At this point, based on the climb performance required, the pilot may elect to return to TA altitude or begin his climb. In either case, the bank angle should be limited to no more than 15 degrees. According to the Dash One, a slow rate of roll-in should be used, not to exceed 3° per second. As the turn progresses, the high terrain will come into view on the EVS and the portion of the terrain trace representing the high terrain will move toward the HRL. Figure 4 illustrates how the terrain trace should appear as the turn progresses. Note that the terrain trace may become jagged or drop out on the left side of the monitor as altitude is increased above that portion of the terrain. Eventually, profile 6 and profile 3 may be selected based on range calls by the radar navigator. Normal peak crossing procedures apply also.

Though this technique still has limitations, it provides another tool for the pilot to use to assess terrain not visible on the EVS. Depending on the number of degrees to be turned, variations of this technique can be employed by knowing the area covered by the TA sector in each range gate. Additionally, it allows us to make more use of the capabilities of our TA system. However, thorough mission planning and effective crew coordination coupled with good judgment remain the key to safe TA operations.

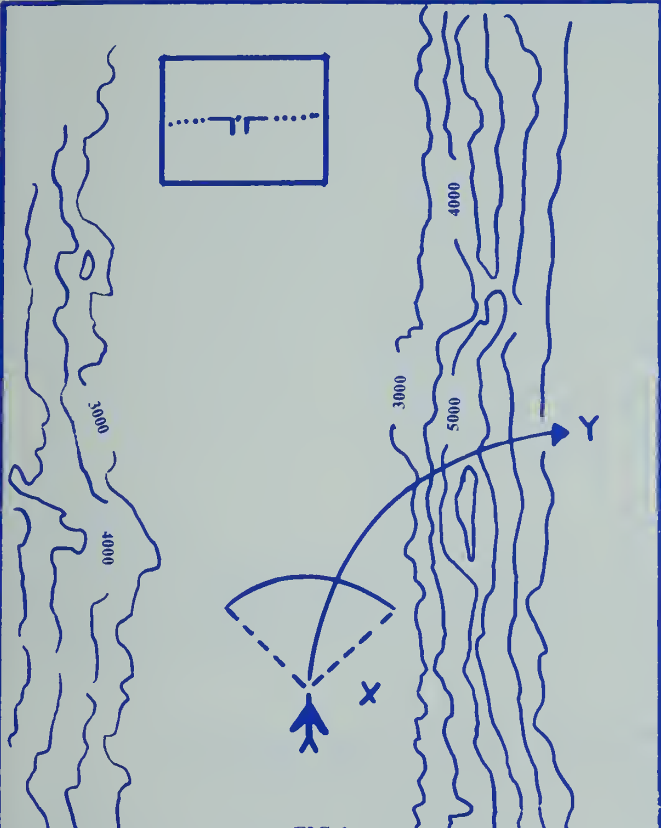


FIG 1

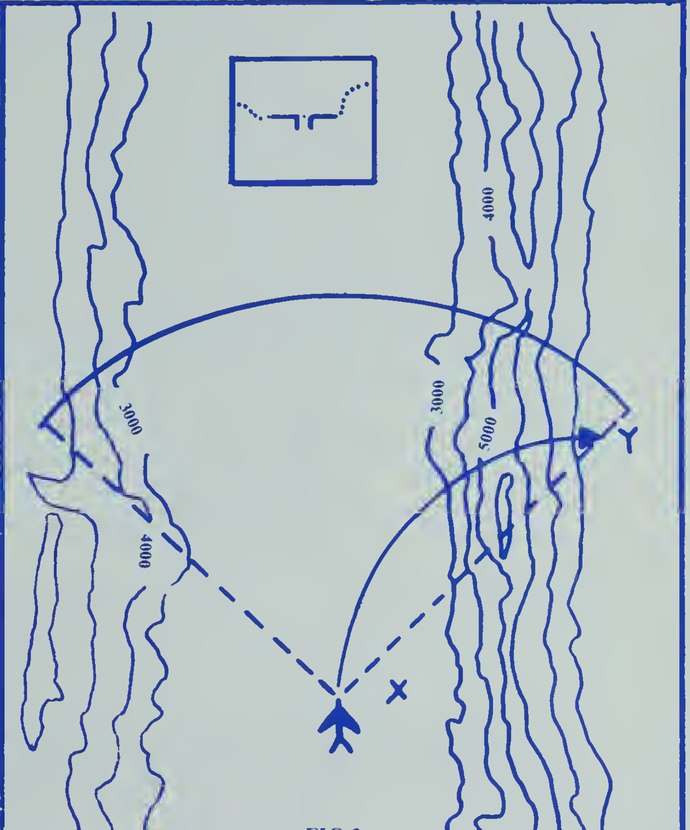


FIG 2

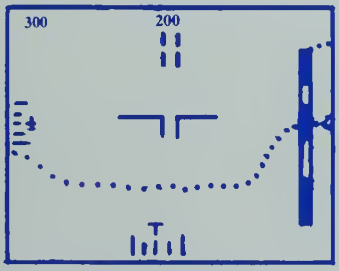


FIG 3

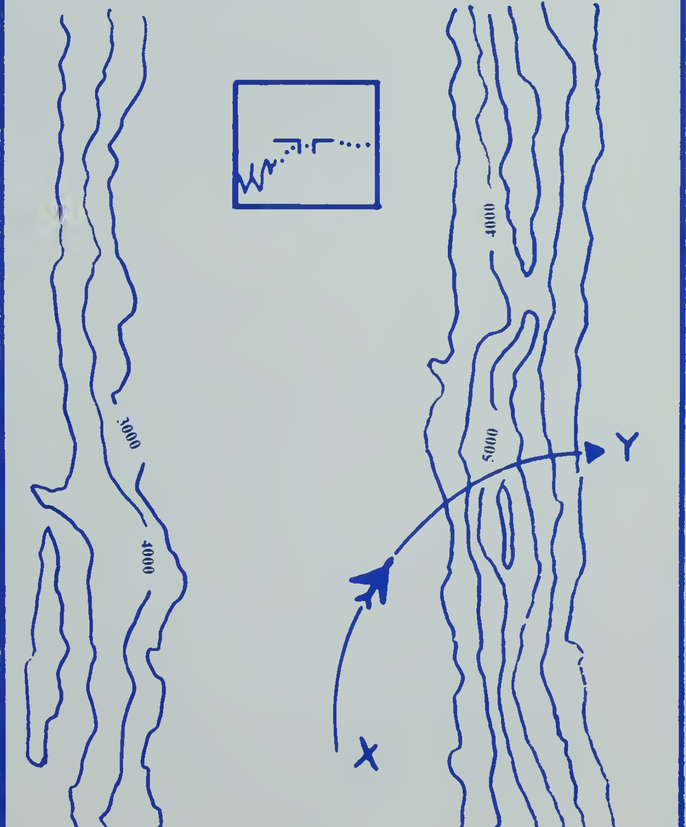


FIG 4

The following feature on being a military aviator was written by General Leavitt just before his retirement. In it he expresses his thoughts on what it takes to be a true professional.

AFTER ACTION REPORT

Lt. Gen. Lloyd R. Leavitt, Jr.
Vice commander in chief, SAC

Combat Crew asked me to pass along a few thoughts before I hang up my parachute for the last time. Looking back on 31 years of flying aircraft, it's difficult to determine what are the most important lessons to pass on. Some things have changed a lot; others, not very much. One thing that hasn't changed — military aviation is still the best profession in the world.

Notice that I said "military" aviation. I'm not against civilian aviation; civilian aviation makes tremendous social and economic contributions to our society. But the purpose is different. Strategy, tactics, and power projection are all part of the military aviator's business. The application of the aircraft as a weapon system is where the challenge has always been for me. I hope it is for you, too.

Once you start thinking of yourself as part of a weapon system, you gain a different perspective about your profession. Your values shift slightly, but importantly. Some aviators sense this only after being exposed to combat. Others sense this when they first become proficient in a military aircraft. Still others never sense it.

During the last three and a half years while serving as Vice CINC, SAC, I have had ample opportunity to survey the combat effectiveness of this command. It's interesting to see patterns develop and repeat. Apparently we have to relearn repeatedly the same old lessons. There is no reliable way to pass on these lessons from airman to airman. Because of this, unit performance goes up and down over time. The best units stay at the top longer, but none seem fireproofed against failure.

What causes these failures? In a broad sense it happens because we don't spend enough time thinking about our job and its combat applications. Too often we know how to do something, but don't know why. There should be ways to avoid this difficulty and in the following paragraphs I will offer some ways.

Flexibility

Airplanes operate in three dimensions. They are inherently a flexible weapon system. The question is whether the people who use airplanes are also flexible. For example, there is no universal, all purpose, right answer to every tactical problem. At whatever level you operate — from SAC HQ to combat crew — you should seek the optimum solution to a particular tactical problem. Don't fall into the snare that says, "That's the way we did it in Vietnam . . . ." or, equally bad, "We've always done it this way . . . ." instead, try to analyze the situation and see what the best tactical application is for a given set of circumstances. Remember: the great battles of history have been won by those who could adapt to a changing situation.

Know Your Enemy

A military aviator must know not only his own equipment, but his potential enemy's equipment. Be honest. How many of you can actually carry on an intelligent, five-minute conversation about the capabilities of the MIG-23, MIG-25, SA-6 or SA-10? How many of you have an intimate knowledge of the inner workings of the Soviet air defense system? Here we see a distinct difference between the military aviator and his civilian counterpart. The civilian aviator has to know all about his aircraft, FAA rules, weather, etc. in order to do his mission. The military aviator has to know all of this plus an intimate knowledge of his enemy. You shouldn't depend on your commander, or his commander, to be the one expert on enemy capabilities. Your chances for survival increase with each bit of knowledge you have about your adversaries. You're not truly professional until you reach this level of understanding. Only then can you plan tactics and military operations that will be effective in combat.

Innovation

The sociology of the United States sharply contrasts with the sociology of the Soviet Union. We are a free society; they are authoritarian. You matured in an environment that encourages free thought. Our capitalistic economy rewards those who are creative and innovative. For this reason, you have been inculcated since childhood with a respect for independent thought and decentralized decision making. Your outlook will always separate you from potential enemies who matured in a different social and economic structure. The extra dimension that you have can be absolutely critical in battle — it can change indecisive action into decisive. It can offset numerically superior forces, moderate the deficiency of old equipment, and provide leadership that will turn defeat into victory.

Training

Some of you have noticed that our training standards are considerably higher than a few years ago. As much as our budget allows, we are committed to realistic training. For example, we stress night, low altitude weapon delivery, while acknowledging the increased difficulty. We tie together wing training into a resultant called Damage Expectancy. Our reason for rigorous training is obvious. Now is the time to learn how to fight, not while flying your first combat mission. Now is the time to find weaknesses, not after we suffer battlefield losses or debacle, such as the misadventure in Iran. Now is the time to prove our equipment, not when it is too late and the battle is lost. Aviators who train tough, fight tough.

In the final analysis, the future hopes and dreams of America rest upon your shoulders. You are the "thin red line" that will always stand between freedom and foreign domination. Whatever else goes wrong with the Air Force, you cannot go wrong. To at least some degree, our nation can tolerate old systems and other shortcomings. We cannot tolerate inept warriors.

As I leave the Strategic Air Command and the United States Air Force, my strongest memories are associated with being a military aviator. I wear those years with pride. There is no greater fellowship than the fellowship of airmen. Whether it is combat or peacetime, the smell of jet fuel and the roar of the jet engines have a romance all their own. Take care of yourself, fly your aircraft professionally, enjoy your flying years and keep America strong.

BIG INST

V

Captain James M. Sullivan
1 CEVG, Barksdale AFB

VFR??? This is supposed to be an instrument feature! Why discuss visual flight rules? Well, it has been a long time since some of us operated under VFR on a daily basis. Some SAC pilots have never operated under VFR on routine training missions. Various circumstances now indicate that it's time to refresh our memory on these procedures. The Air Traffic Control system in the United States has passed a test of its resilience and flexibility. We can, however, relieve some of the controllers' workload by operating under visual flight rules for portions of our missions. We can safely accomplish our training with professional "heads up" airmanship and a basic knowledge of the VFR world.

VFR doesn't mean we can't use the instrument aids available to us. We don't have to limit our navigation to the interstate concrete compass or **V**ery **F**ine **R**oad. Our aircraft are equipped with navigation aids (including radar), which can and should be used for departures, enroute navigation, and arrival.

A singular advantage of VFR operations is the reduction of takeoff delays which might affect your mission. Since no IFR clearance is required, tower clearance for takeoff is all you need to start your day. Your signature on the flight plan is your clearance to operate VFR on the "see and avoid" principle. Your flight plan, by the way, should be filled out in much the same way as an IFR flight plan using the guidance provided in FLIP/GP.

COMMUNICATIONS

Operations under VFR do not relieve you of the responsibility to maintain air-to-ground communications. On takeoff, for example, you should be in contact with the tower until leaving the airport traffic area. If STAGE radar service is available, request traffic advisories from the controlling agency. Remember that STAGE service may be available not only during departure and arrival, but along your route of flight as well. When not in contact with any controlling agency, monitor Flight Service. If your aircraft is equipped with more than one radio, attempt to maintain a listening watch on the appropriate Air Route Traffic Control Center frequency found in the FLIP IFR Supplement. Good flight planning will ease your inflight workload if you annotate those frequencies before takeoff.

EYEBALL

What about some rules of the road and rules of thumb? First and foremost is **heads up.** You are sharing airspace with a lot of folks, including other military aviators as well as a whole group of general aviation pilots. When you operate under IFR, you have the benefit of ground-based radar to provide traffic advisories on known IFR and VFR traffic. When operating under VFR, your eyeballs are your radar — use them well!

AIRSPEED, ALTITUDE, AND HEADING

When we fly instruments, the name of the game is

RUMENT

R

to maintain desired heading, altitude, and airspeed. Two out of three doesn't hack it. The same is true under visual flight rules. The additional responsibility, of course, is the need to clear effectively for other aircraft.

AFR 60-16 states that pilots will not fly aircraft VFR above 3,000 feet AGL at altitudes other than those specified in FLIP. High and low altitude FLIP enroute charts specify VFR altitudes based on your aircraft heading. Basically, when heading East you should fly at odd thousands, plus five hundred feet, e.g., 13,500. The converse is true for Westerly headings: fly **even** thousands plus 500 feet, such as 10,500.

A recent waiver to AFR 60-16 permits us to operate VFR on airways. This is a temporary authorization which will facilitate positive course guidance while allowing pilots to clear for other aircraft. In many cases, we fly at higher airspeed than many general aviation aircraft and have a responsibility to see and avoid them. Remember also that 250 KIAS is the maximum airspeed below 10,000 feet MSL except when operating under the exemptions listed in AFR 60-16 (MOAs, IRs, VRs, etc.).

ARRIVAL

Pilots on a VFR flight plan can still practice instrument approaches. The Airman's Information Manual (AIM) describes certain conditions for this type of operation. Pilots who request this service should specify "practice" approach and must observe the basic VFR rules concerning ceiling and visibility. Air Traffic Control will approve practice instrument approaches depending on traffic and workload. When an approach control is located at the airport, the controller will instruct the aircraft to maintain VFR conditions and will provide standard separation between aircraft he has authorized to practice instrument approaches and between such aircraft and any IFR aircraft. Note that separation will not be provided to VFR aircraft on a missed approach without prior coordination and ATC approval of the maneuver.

When approved standard separation cannot be provided for practice instrument approaches, the tower will approve the approach and issue traffic information. In all cases pilots should be alert for other aircraft operating near the airport.

CLEAR, AND CLEAR WELL.

IFR flight plans and the benefits of positive control are certainly desirable. However, when weather and mission permits, VFR flight is a flexible option which we can use to get the job done. This flexibility and your VFR clearance authority carry a responsibility: to avoid other aircraft and safely share the airspace. Preparation for VFR flight requires the same detailed planning as for an IFR flight — and maybe more. Take the time today to make it safe tomorrow.

ROBINS'

WINNERS

The 19th BMW GIANT SWORD team carried home the Barrentine Memorial Trophy to Georgia, late in September, when they won SAC's 1981 Loading Competition. The **Robins Air Force Base** unit beat out all competing wings at Ellsworth AFB during the annual competition with a final score of 2,859.75 out of a possible 3,000 points.

General Bennie L. Davis, Commander in Chief, Strategic Air Command, was on hand to present the Barrentine Trophy, a memorial to CMSgt Wilbur Barrentine, a dynamic force in munition loading for 15 years until his death in 1960.

He presented the trophy to the jubilant members from the Robins team saying: "GIANT SWORD recognizes the significant contributions of munitions people, aircraft crew chiefs and security police of the SAC mission." He also noted, "You truly represent the hard core of the Air Force. Without you, we just couldn't do it."

The General went on to say that events such as GIANT SWORD 81 enhance the Air Force's day-to-day operation while helping to develop new techniques of operation.

Following close behind Robins was the 509th Bomb Wing from Pease AFB, in second place and the 7th Bomb Wing, Carswell, in third place.

Besides the Barrentine Trophy the 19th Bomb Wing also took the Spirit Bell Award, which is voted by all 20 competing teams to that one team displaying the greatest esprit de corps. This particular award was aboard the first B-52 to bomb Hanoi, and at one time was displayed at an NCO club in Thailand.

In the competition, the 19th's **security police team** took first place with 1,415 points out of a possible 1,500 points. While, in the weapons fire phase of competition, **SSgt Gerald Naranjo** repeated his feat of last year by scoring a perfect 40 out of 40 with the M-16 rifle. The team was also rated the best in SAC on a practical exercise.

The 19th load team, headed by SSgt Dwight Addis, took fifth place with 1,216 points out of a possible 1,250. The team had two perfect uploads and a perfect tool box.

Aircraft crew chief SSgt Dale Stone of the 19th OMS took third place with 226 points out of a possible 250.

GIANT SWORD 81

Sergeant Mike Hastings

With the theme "A winning attitude", the finest weapons loaders, security police teams and crew chiefs from the twenty bomb wings within the Strategic Air Command gathered at Ellsworth AFB, South Dakota, to compete in the annual SAC munitions loading competition, GIANT SWORD 81. After ten days of intense contest, the 19th Bomb Wing from Robins AFB, Georgia, emerged as the best of the best.

The competition began on 14 September with team members, SAC wing commanders and others meeting to hear opening remarks.

"Competition and trophies are won by those who believe in winning," said Col Wayne Lambert, commander, 28th BMW, at the GIANT SWORD opening ceremonies.

Although only one team of the 20 competing will win, the true mark of a champion is how often he is able to recover, said the Colonel.

Col Joseph Stone, commander, 44th SMW, quoted George Washington Carver in his opening address, saying, "Those who do the common things in life in an uncommon way, gain the attention of the world." The Colonel expanded on this with, "You who do the uncommon and difficult things in life, in an uncommon way, gain both the attention and respect of the world."

Col Stone referred to the GIANT SWORD competitors as the finest warriors in the Strategic Air Command, and the best of the best.

Also speaking at the opening ceremonies was CMSgt Thomas Byrne, senior enlisted advisor of the 15th AF. The Chief stressed the pressures involved in training for GIANT SWORD, and the tremendous efforts made by everyone.

"The eyes of the entire enlisted force are upon you competitors," Chief Byrne said, noting that GIANT SWORD is an all enlisted event.

"Whatever you win in this will be icing on the cake, because you're winners," he added.

The competition was a hard fought battle all the way. After this first day of the meet the 509th BMW, Pease, took the lead, followed by the 7th BMW in second place and the 96th BMW in third place.

In the second day of the competition, the 410th BMW from K. I. Sawyer held the first place spot, followed by the 7th BMW. Then, after the third day of the event, K. I. Sawyer held in first spot with some 1,399 points, still followed closely by the 7th BMW with only six points less.

To increase involvement, the competition was expanded this year. In the past only training devices shaped as gravity weapons were used. This year, the six B-52D model wings participated in a conventional weapons loading segment.

The 22nd Bomb Wing from March AFB, California, won the event with a perfect score. Though the 7th Bomb Wing from Carswell AFB, Texas, also performed a perfect load, they took one minute, seventeen seconds longer, and ended in second place.

Another important addition to the competition this year was the use of a Multiple Integrated Laser Engagement System, or "MILES". This system, used by the security police teams during their exercises, was designed to save lives, even as it 'kills'.

The system consists of a laser transmitter that is attached to their M-16 barrels and a receiver that records hits or near misses from the beams of laser light that are fired from the transmitter.

"We no longer have to play "Bang, bang, you're dead," said Major Martin E. Strones, head of the Department of Energy's security training program. Major Strones was on hand to supervise the use of the equipment during the competition.

"This system gives us combat experience that will keep people alive if they ever get in the real thing," says Strones.

"You put on this gear and you're in combat, and if you go on one side of the building and I go on the other and we both want to live, whether I kill you or you kill me is no longer dependent on an umpire who doesn't look down my gun barrel," the Major said.

According to Strones, the system will save the Air Force money and time in training people the correct ways to fight and live.

The security police team from Robins played a major role in the wing's overall victory by winning their portion of the competition. The team performed the best practical exercise among the competitors and totaled 1417 points, barely edging out the 22nd Bomb Wing team from March by eight points.

The second place team overall from Pease AFB captured two awards, winning the Best Munitions Equipment portion as well as registering the Best FB-111A Load.

Also capturing two individual awards was the 93rd Bomb Wing from Castle AFB, California, who received the Best Munitions Load Crew award, and also the Best B-52 Load award. The Castle team finished ninth overall.

The 28th Bomb Wing from the host unit at Ellsworth AFB also received two awards, winning the Best Munitions Loads, and the Best Short Range Attack Missile Load award. The Ellsworth team finished fourth overall.

Single awards were given to the 380th Bomb Wing from Plattsburgh AFB, New York, for Best Organizational Maintenance Squadron Crew Chief, and to the 320th Bomb Wing from Mather

THE WINNERS

Barrentine Trophy	Robins	19 BMW
Best Munitions Load Crew	Castle	93 BMW
Best Security Police Team	Robins	19 BMW
Best Crew Chief	Plattsburgh	380 BMW
Best Munitions Load	Ellsworth	28 BMW
Best Munitions Equipment	Pease	509 BMW
Best FB-111A Load	Pease	509 BMW
Best B-52 Load	Castle	93 BMW
Best Short Range Attack Missile Load	Ellsworth	28 BMW
Best Security Police Exercise	Robins	19 BMW
Best Security Police Marksman	Mather	320 BMW
Best Security Police Testing	Pease	509 BMW
Best Crew Chief Testing	Ellsworth	28 BMW
Best OMS Testing	Carswell	7 BMW
Best Crew Chief Preload Exercise	Plattsburgh	380 BMW
Best Crew Chief Postload Exercise	Ellsworth	28 BMW
Best Conventional Munitions Load	March	22 BMW
Best Security Police Supervisor	Pease	509 BMW

AFB, California, for the Best Security Police Squadron Marksmanship.

Rounding out the top ten teams in the final wing standings were: the 7th Bomb Wing from Carswell AFB, Texas, in third place; the 410th Bomb Wing from K.I. Sawyer AFB, Michigan, in sixth; the 96th Bomb Wing from Dyess AFB, Texas, in seventh; the 380th Bomb Wing from Plattsburgh in eighth; the 93rd Bomb Wing from Castle AFB in ninth; and the 416th Bomb Wing from Griffiss AFB, New York, finishing in tenth place.

As emphasized throughout the competition, the agony of defeat was never present at Ellsworth. Every team felt the pride of representing their wings as the best at what they do. Over 240 men and women of near equal ability met in spirited competition over a period of ten days. Only a few went home with trophies, but all left as winners.

UNKNOWN . . .

Continued from Page 9

But then I started looking deeper inside. The responsibility of the lives of the men should be my first priority; and **that** my fellow readers, cannot receive enough emphasis. Sure, complete the mission if you can, but don't jeopardize yourself, your crew mates, or valuable property for ego and "can do" attitude.

I then asked the navigator for an emergency field. He replied by stating either Blytheville or Little Rock. I asked which was the closest and that's when everything came loose. If you can believe this not one of us was sure which base was which. Then the nav came back and said, "Hey, pilot, look at my fingers." No doubt in my mind now. His fingers were blue. The copilot still had problems breathing, whereas the boom was in a euphoric state of being with dreams of bringing the plane in himself. After a quick discussion, we elected Blytheville and requested an emergency descent.

Calling for the descent checklist, I demanded everyone's attention to the altimeters, and to make sure EVERYONE was backing each other up.

While trying to brief the approach, my hand trembled so badly that I could not read the approach plate. I asked the copilot for the status of his condition. He replied that breathing was improving now that we were at a lower altitude. So I directed him to make the approach and landing. There was excellent crew coordination going on considering the problems. The nav then contacted command post who already knew of our inbound flight through Memphis Center. He communicated to them that the copilot would be making the landing due to the pilot's physical condition. Command post called back transmitting that emergency vehicles were in place. Once ARTCC center turned us over to Blytheville approach, a nice long straight in PAR was flown while we were backing it up with an ILS. With all checklists completed, we were set for the approach . . . so I thought. That's when the copilot said over the intercom, "Pilot, copilot, I don't feel so good." We looked at each other, and I thought, "I know how bad I feel, is he as bad as I am, or worse." I then briefed the crew that I would fly the approach and landing. The nav then rebriefed command post who probably thought by this time that we were all nutso!

Going to the call position on the wafer switch, I announced to the crew that any time I did not respond to a heading or glideslope call by the second transmission, the copilot was to take immediate control. They were then directed to pull me away from the controls if I did not relinquish them. Sounds a bit melodramatic, doesn't it? But do you remember seeing someone in the altitude chamber going spastic when directed to do something and incapable of doing it? I did!

Anyway, assured of landing weight below 170,000 pounds, the approach and landing were uneventful. After lengthy physicals with our blood pressure readings in the 170's over 130's, they decided to keep us for observation for a couple of days at the base.

Now it was safety's position to determine the problem and its cause. After a short period of investigation, some important information was related to HQ Air Force. After checking the pressurization system and finding nothing, maintenance checked both gaseous and liquid oxygen systems for contamination. Nothing was found there. However we did have a full LOX system with a failure of the gauge and regulator. Then with no other apparent reason for the physiological incident, safety called the PDM people for some answers and bingo, the jackpot! They had pursued the matter further which we had so by-passingly briefed to hospital personnel on our 48-72 hour history regarding the smell in the aircraft.

Depot told the safety people that they use a chemical solution called trichloroethane to clean engine parts. During that morning they had cleaned oil and grease off the carpets in the cockpit and around the galley of our aircraft. TCE, as it is so commonly known, had been used as an anesthetic in hospitals but later shelved for one reason or another.

People back at home reassured me that I had made a wise inflight decision (prior to learning about the findings) which was a welcomed reassurance. Career still intact so far, I relaxed a bit. You may not think it to be anything spectacular such as a complete hydraulic loss, an engine fire, or something of that nature. And you are right, it is not. But what is more frightening? Handling a situation that you know how to deal with, with full faculties, or trying to figure out if you have a problem and what that unknown problem is? Especially when everyone's life is on the line. Our crew remembers what the flight surgeons and safety officers said and I quote: "You probably would have passed out in flight and crashed into the ocean after fuel starvation. The accident report on your flight could have read, pilot crew error!" Believe me, there are four of us who did think of it as frightening and we're glad to be able to pass this one on.

Dealing with the unknown does not always have to involve an aircraft system malfunction that is hard to find. The unknown may be within your own mind (like not knowing the aircraft systems as well as we should). Which is harder to deal with: the unknown within the confines of the mind or the unknown in the malfunctioning of the aircraft? Or could it be both? That's the unknown!

PACE 8102, SELM at Malmstrom AFB

Captain N. C. Hoefer
341st SMW, Malmstrom AFB

Malmstrom was tasked with this year's SELM (Simulated Electronic Launch of Minuteman) at its most distant launch facilities. A test which proved the professionalism of the people assigned to the 341st Strategic Missile Wing.

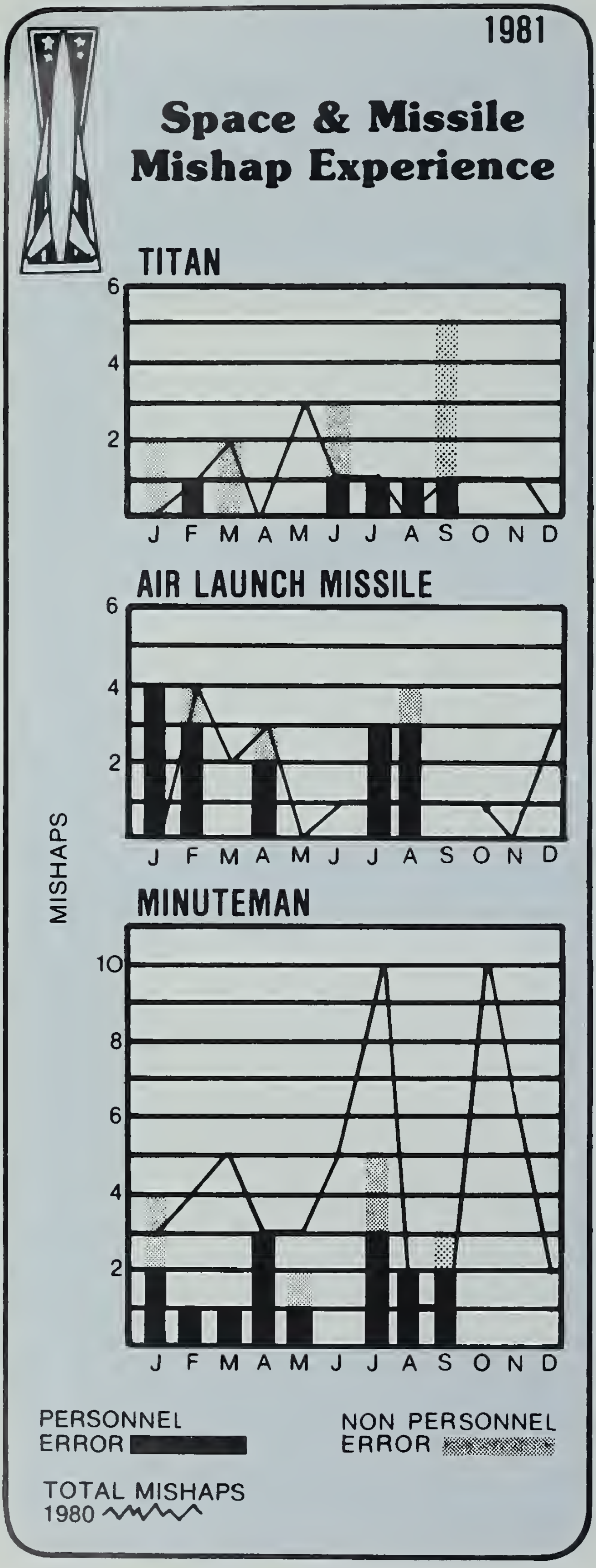
SELM was designed to test and verify the ability of the Minuteman's missile ground support launch equipment to process and issue a launch command to the missile. At Malmstrom five of the eleven test sites were checked to insure umbilicals would release and retract against the silo wall. One test site was checked to insure it could maintain operational capability on emergency power. Two sites were selected to insure the articulating arms (stabilizing arms that hold the missile in place against surrounding ground vibration) retracted upon command. While yet another site's ability to receive a ground retransmission of an airborn launch control center UHF command with inoperative UHF receivers. The entire SELM program conducted at Malmstrom and all the other Minuteman Wings cost less than one actual operational firing at Vandenberg AFB. SELM offers a considerable savings as anyone can see while verifying the key launch components of several missile launch facilities (LF) — 10 to 11 LFs based on whether it is a W133A or B weapon system.

The distances imposed on Malmstrom during this year's SELM posed a difficult logistics problem for movement of both material and personnel to and from the support base (SMSB). Schedules were developed to allow personnel to remain overnight at the local launch control to avoid the 6-hour round trip driving time and to keep personnel within their working timelines. This permitted maintenance teams to be well rested and in the immediate test flight early in the morning to remove the RV, install the test equipment and return to the SMSB. The reverse was also true when driving the EWO buildup after the SELM test. The concept of prepositioning missile maintenance teams in order to complete maintenance and return the operational components to the SMSB enhanced security of the resources as well as improved maintenance flow. Additionally, helicopter support for the RV movement was minimized. The incorporation of the above procedure into the SELM effort resulted in the sites being postured with minimum delays and professional application of job skills.

The entire exercise was not without incident however. A problem discovered at one site resulted in a complete missile removal and replacement before ground test date. While at another site, an A Vault pit lockout was encountered on ground test day. Fortunately, a site security team was able to dullout the A Vault which permitted the sortie to be tested and executed without incident.

SELM in Montana for the last two years has been performed during less than ideal weather and visibility. Last year's Mt. St. Helen's eruption created low visibility and reduced outdoor activity until the dust settled. This year, a late spring snow storm covered the Eastern half of the Malmstrom complex with a wet heavy snow. As fate would have it, warm winds (Chinooks) and heavy rains followed resulting in washed out roads and bridges enroute to the SELM test flight. Again, due to advanced planning, scheduling, and maintenance, there was minimal interruption to maintenance and posturing of the SELM test.

The entire operational test preparation began 11 May 81 with the ground test beginning 2 Jun 81 and the airborne test 4 Jun. The reposture to operational alert status began 5 Jun and completed 20 Jun 81. Despite the conditions and problems encountered, GIANT PACE 81-2 SELM test was on time and successfully satisfied all the test objectives. All tests were successful. ALL GIANT PACE 81-2 SELM milestones both locally and higher headquarters generated were met. The people of Malmstrom are proud professionals and rightly should be when they look at their accomplishments in providing support to SELM in SAC's largest Minuteman complex.



MISSILE MISHAPS

DROPPED DRAWERS

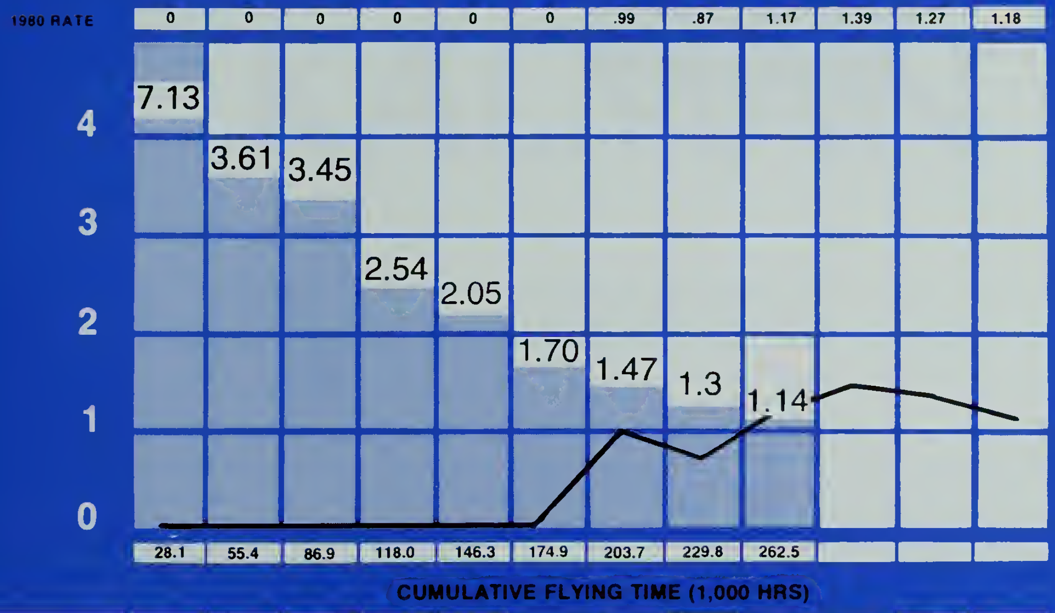
An electro-mechanical team had dispatched to a launch facility to support SELM testing. During backout procedures, the team was raising radio drawers up the personnel access hatch to return them to the support base. The team did not have a sling with them for raising the drawers and elected to hook the rope around the drawer cases. While raising an SELM test MF radio drawer, the rope came undone and the drawer fell the entire length of the personnel access hatch. Investigation is pending. Lessons learned: Insure that all required equipment is on hand for dispatch. Requirements in technical orders are there for a reason.

ANOTHER CUT CABLE

During a missile guidance set R&R, a missile maintenance team severed the W-955 cable (liquid spring pressure monitor cable) while traversing the workcage in the area of the umbilicals. The workcage technician was aware of the T O caution to use extreme care when operating the workcage in this area. The severed cable was discovered when the workcage was traversed into the area of the umbilicals for the third time. The damage most likely occurred during the second task in this area since the technician had some difficulty in moving the workcage during the task. Since this is the fourth occurrence of this type, HQ SAC/LGB has directed all Minuteman units to tape these cables in accordance with a change to the Launch Facility Intrasite Cabling tech order.

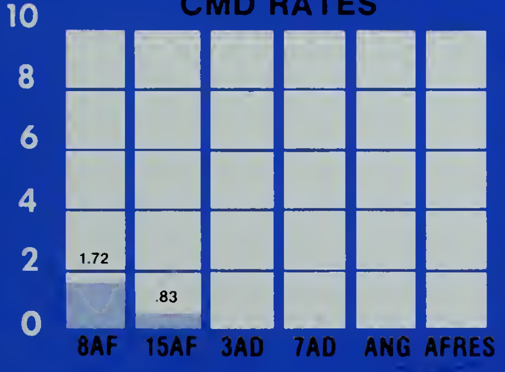
1981 Flying Safety Rate

SAC CLASS A MISHAP RATE (PER 100,000 FLYING HRS)



MISHAPS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1980	0	0	0	0	0	0	2	0	1	1	0	0
1981	2	0	1	0	0	0	0	0	0			

1981 SUBORDINATE CMD RATES



SAC GAINED

LEGEND ⁄\ = 1980 RATE (SAC)
+ = ANG
• = AFRES

MISHAP STATUS

KC-135 A	JAN '81
FB-111A	JAN '81
RC-135S	MAR '81

SCHULER

Major John Mitchell/Captain Steve Cheavens
Central Flight Instructor Course
Castle AFB, CA

Most SRAM operators have heard of Schuler and Kalman, they just don't know what they are. Are they something that the SRAM does or are they something that is done to the SRAM? The answer is yes. But, maybe we better explain a little further.

Let's start with an explanation of the Schuler cycle and then talk about Kalman filtering. In addition, we'll try to keep this in English and not "engineer". The Schuler cycle is the thing that **happens to** the SRAM. Specifically, it happens to the stable platform (gyro). If you just build a gyro and then accelerate with it, it will oscillate all over the place. However, Dr Schuler discovered that if you construct a gyro to exhibit the properties of a pendulum with a length equal to the radius of the earth, acceleration across the earth's surface won't disturb the gyro. Any errors that are introduced and cause the stable platform to oscillate are averaged out over a period of 84.4 minutes. Those other errors include things like initial platform tilt, gyro drift and velocity errors.

What you end up with is a trade-off. By constructing your gyro to take advantage of the Schuler cycle, you reduce random oscillations. What you get is a predictable oscillation, where the stable platform tilts one direction and then swings back in an equal and opposite direction every 84.4 minutes. In an uncorrected gyro, these oscillations would not get any smaller. In fact, in the SRAM stable element, if you introduce any gyro drift or velocity errors, the oscillation would get bigger. Since we depend on our gyro to provide precise azimuth and velocity data for missile alignment and position data for targeting (not to mention for aircraft navigation), we probably want to do something about Schuler. This leads us into the something that is **done to** the SRAM: Kalman filtering. Most of us know Kalman Filtering by the job it performs during check point fixing procedures. Initially the SRAM CAE will accept check point fixes of marginal quality, but with continued fine alignment the equipment, through Kalman Filtering, becomes more selective later in the programming leg. The filter acts as a quality control mechanism which compares BNS range to the check point fix (CPF) with values determined by inertial navigation of the SRAM. If the differences exceed the tolerances of the Kalman Filter, the check point fix is rejected, if not, the check point fix is accepted and used to improve the navigation ability of the inertial system. If the CPF is accepted, it is the Kalman Filter that determines how much of the update is integrated into the SRAM inertial system. In other words, the Kalman Filter employs a "computational technique for processing BNS velocity and position measurements together with inertial navigation data to obtain optimum navigation accuracy". However, the Kalman Filter does much more than monitor and compare the accuracy of check point fixes and determine the

CFIC CORNER

VS KALMAN

reject/accept limits. The Kalman Filter is, in actuality, not a filter at all but rather a preprogrammed statistical analyzer located in the master computer. If it were possible to provide a perfect platform that would not be affected by gravity we would have no need for the filter. The SRAM depends on a gyro leveled platform and accelerometers as its basis for accurate navigation, and platform tilt with gyro drift are responsible for the majority of errors. The Kalman Filter uses torquing signals to attempt to cancel the effects of these and other errors. The filter corrects primarily the errors that are statistically expected to be the largest contributor at a given time in the programming leg. For example, early in the alignment, Schuler oscillations are expected to create the largest error so corrections in the form of torquing signals are sent to the IMU to correct for platform tilt. In addition, doppler errors, gyro drift and azimuth errors are eventually corrected for by Kalman Filtering. The success of the filter in correcting errors is primarily dependent on (1) the correctness of the statistical probability that the error being corrected is the one responsible, and (2) that the error is reasonably constant. For this reason, if we experience doppler failure and decide to use memory point winds for the SRAM, we would expect that accuracy would suffer due to the fact that winds are no longer consistent, therefore correction values will continue to be applied, but not correct values. A similar problem arises if the Kalman Filter recognizes an error but incorrectly attributes it to Schuler oscillation instead of, for example, doppler error. One aid to this filtering is the use of turns and changes in ground speed. This allows the Kalman Filter to determine whether the errors are the effects of doppler or other system errors. Position fixing also assists with this determination. The Kalman Filter compares information every six seconds. It compares expected values with actual observed errors and compares the extent to which errors are affected by other errors. This dual process analyzes fifteen separate system errors. Corrections are then sent to the IMU based on the square of the expected error. For example, if platform tilt is statistically expected to produce three times as much error as velocity at a point in the alignment, then the correction sent to improve tilt would be **nine** times the correction sent to improve velocity. The fifteen variables examined and corrected by the Kalman Filter are: 1&2 inertial X&Y position error, 3&4, inertial velocity error, 5&6, X&Y axes platform tilt, 7, platform Z axis misalignment, 8-10, gyro drift about three axes, 11, computational misalignment about Z axis, and 12-15, four separate doppler errors.

SUMMARY

This system is not perfect. Platform level problems like the Schuler Cycle and other inherent errors continue to be a problem. However, because of the Kalman and its dual role, evaluating and using check point fixes and evaluating and utilizing BNS tie-in information, we have an inertial navigation system that is far superior to equipment we had in the past. The functions of the filter work in concert to reduce the majority of errors involved and give us a tremendous aid to navigation. Understanding these limitations and capabilities of the SRAM CAE will make you a better operator.

Missile Crew of the Month

91st SMW Crew E-141, Capt Warren R. Adams, MCCC and 2Lt Kenneth G. Eversole, DMCCC, have been selected Strategic Air Command Missile Crew of the Month. During Lt Eversole's rest period, Capt Adams noticed the faint smell of smoldering plastic and immediately initiated a search for an overheat condition. Within seconds, the entire launch control capsule (LCC) was filled with smoke. Lt Eversole was alerted to the situation and the crew began processing the LCC fire emergency checklist. Suspecting the motor generator (MG), the crew removed the MG access cover, releasing a cloud of smoke into the LCC. While Capt Adams took fire isolation steps, the DMCCC accomplished preparatory actions for LCC evacuation. Before the alternate current side of the MG could be isolated, the emergency lights faded out and the line printer unit went "off line." The crew immediately checked to insure that a complete loss of power had not occurred and quickly tripped the proper circuit breaker. The MG smoothed out instantaneously, lighting returned, and smoke ceased pouring from the MG access cover. After the incident and damage were reported to the wing job control and command post, it was decided to shut down the LCC and transfer flight responsibility to another LCC. In this situation, the crew's ability to think fast and meet all tech order requirements prevented possible system degradation.

Maintenance Airmen of the MONTH

TSgt Gregory S. Clute, 416th MMS, 416th Bombardment Wing, Griffiss AFB.

SSgt Richard E. Ballard, 390th Strategic Missile Wing, Davis Monthan AFB.

Safety Man of the Month

Capt Timothy R. Zeigler is Unit Safety Officer 321st OMMS, Grand Forks AFB. His personal involvement in all areas of safety has made significant contributions to the squadron safety record. OMMS personnel drive thousands of miles annually over an area approximately the size of New Jersey in general and special purpose vehicles to support the dispersed Minuteman weapon system. Driving safety is paramount, Capt Zeigler employs a comprehensive, one-on-one briefing to review an individual's driving performance/driving experience, especially exposure to winter driving hazards. Government vehicle operator responsibilities and especially the importance of seat belt usage are stressed. Based on this interview, a recommendation is made whether to issue the individual a military driver's license. To underscore the importance of seat belts, Capt Zeigler conducts periodic spot checks of seat belt use. The section with the highest usage receives special recognition. He has also launched a campaign to track accident-free days in each shop, presented formal safety briefings at commander's call and maintains an informal bulletin board within the squadron dealing with traffic safety at missile launch facilities. His dedication to safety is a credit to himself and SAC.

PROFESSIONAL PERFORMERS

HEADS UP

During a refueling flight out of Travis AFB, the boom operator, SrA Clifford T. Gromely, Crew E-133, noticed that the number two engine on the B-52 was leaking fuel and initiated a disconnect. He calmly informed the B-52 aircraft commander of the problem which was undetected in their cockpit. SrA Gromley then visually assisted the bomber crew in defining the source and magnitude of the leak. As a result, SrA Gromley's detection and concise description of the leak enabled the crew to remedy the situation before it reached a critical stage. The B-52 pilot elected to shut down the engine and stop the leak by pulling the T-handle. An emergency was declared and the B-52 made an uneventful recovery at home station. Postflight investigation revealed a fuel line had ruptured in the engine, SrA Gromley's quick reaction and sound judgment averted a probable engine fire which could have been disastrous. He definitely exhibited the highest standards of professionalism and safety consciousness in the quick detection and accurate assessment of a potentially catastrophic inflight hazard.

COPING WITH WEATHER . . .

Continued from Page 7

to expect; being prepared is half the battle.

Before takeoff, if safety permits, the aircraft radar can be used to identify a safe departure route. Remember that when looking from the ground up through weather activity, things often look more intense than they really are. Metro and departure control can provide valuable inputs for analyzing the weather situation. When choosing a course of action, use the guidelines in AFR 60-16 and assess all available data.

Once airborne, the aircraft radar can provide advance warning of weather areas, a measure of their intensity and an estimation of tops through the proper use of four essential controls: beam pattern, tilt, gain and sensitivity time control.

By selecting a pencil beam pattern, all the radar's energy is radiated in a narrow beam, usually five degrees. Employment of this beam type coupled with proper use of the tilt mechanism allows the navigator to "aim" his radar and thereby detect very distant weather targets as well as determine the height of storms. With pencil beam selected, a sound technique for setting tilt is to raise the antenna until ground returns just disappear off the outer edge of the scope. This technique insures that the radar will detect weather at and below the aircraft altitude. (Because of errors in calibration, merely setting the tilt knob on "zero" will not insure that the radar is looking straight ahead: it may in fact be pointed up and not detect weather at your altitude. See chart.)

Gain and sensitivity time control (STC) are jointly used to determine the intensity of weather. Enough gain must be used to cause a return from the weather area; generally the gain setting is higher for weather detection than for ground mapping. Remember, it is the rain droplets in a weather area that produce returns. Once an area of weather is detected, the STC can be used to eliminate returns from less intense rain showers. This feature is especially helpful when penetrating a hole in a line of weather or identifying embedded thunderstorms. Be aware, however, this hole or weak return may be caused by attenuation and may be in fact a very strong thunderstorm. The NTSB report on the Air Wisconsin crash near Omaha in June 1980 states:

"Three important lessons must be learned from this accident. First, airborne radar cannot and should not be used to penetrate severe weather. Secondly existing airborne weather radar cannot be relied upon exclusively for severe weather detection and avoidance. Third, when atmospheric conditions exist which would limit the capabilities of airborne weather radar, the flight crew must seek additional assistance from ATC and company sources."

The primary condition which limits capabilities of airborne radar is heavy precipitation. For the Air Force, the company source is Metro. Unfortunately, many air crews believe it is safe to penetrate thunderstorm activity with radar, when in fact it is extremely hazardous.

When altering around weather, a couple of techniques are useful. In order to have enough time to plan an alter, identify weather areas as far off as possible — this means aggressively searching for them. By making several sufficient alters rather than numerous insufficient alters, crew coordination and extra work for the navigator are reduced. To make things easier, whenever possible, keep as much of the planned mission intact as safety will permit. If, however, major replanning proves necessary, make the decision to replan as soon as possible and select new routing that is simple — your preparations during mission planning help here.

In regard to air refueling operations and weather avoidance, when a rendezvous/air refueling area has to be moved because of hazardous weather, there are five points to remember:

- If possible, because of airspace requirements, move the refueling to a completely new track clear of the weather area. This alternative is most inviting during mission planning or early on the flight day.
- Move the entire track in a direction a specified number of miles, i.e., north 40 nmi. This maintains course integrity and makes replanning fairly simple.
- In anticipation of an alternate rendezvous, use available ground navigation aids, i.e., make the ARIP or ARCP over a TACAN.
- If only a portion of the track is unuseable, it is often possible to run rendezvous/air refueling operations on the useable portion. If the ARIP is the only weather area, consider an enroute or on-course rendezvous rather than a point parallel.
- Be sure to keep ETAs updated and ARTCC informed.

It is important from a flight safety standpoint that ARTCC be informed of all deviations due to weather — before the alter if possible. Inform center of when you intend to alter, how far off course you will go, when and how you intend to get back on course, and if possible, the radial and DME of points along your alteration route.

While it is true that weather poses a major challenge to SAC flight operations, it is also clear that crews can make a big contribution toward coping with that challenge. By careful planning and access to current weather data, preparation will maximize viable alternatives. Correct and aggressive use of radar equipment will help identify weather early and an application of sound judgment when altering around weather will reduce potential impact on mission success.

SAC SAFETY SCREEN

920 AREFS, Wurtsmith Crew E-154: P Capt Bobby R Nowlin, CP Capt Timothy Gamble, N 1Lt John T O'Briant, BO Sgt Clifford G Doering

379 BMW, Wurtsmith Crew E-22: FP Capt Raul Bennett, CP 1LT Linwood Mason Jr, RN Capt John J Wallace, NN 2Lt Kurt C Anderson, EW 1Lt Thomas A Bucklin, AG SSgt Richard W Marshall, EP Maj John E York

509 AREFS, Pease Crew E-120: P Maj Mark D Willey, CP Capt Raymond R Brunelle, N Capt Carl F Roediger, BO SSgt Robert E Christopher

509 AREFS, Pease Crew E-111: P Capt William Maiorano, CP Capt David W Roberts, N Capt Jon C Morrow, BO SSgt Stephen C Baudanza

393 BMS, Pease Crew E-27: P Capt Edward J Pearce III, N Capt Peter G Glushko

170 AREFG, McGuire AFB: P Capt James T Sherry, CP Capt Robert H Beebe, N Capt Peter D Smoley, BO SSgt Kevin J Keehn

128 ARG, Gen Mitchell Fld: P Capt Michael R Heuer, P Capt Gary B Wiesner, N 1Lt Mark A Bunker, BO MSgt John R Famularo

90 SMW, F E Warren Crew R-109: MCCC Capt Terrence J Young, DMCCC 2Lt Stephen J Repanich

341 SMW, Malmstrom Crew R-168: MCCC 1Lt David M Bragell, DMCCC 2Lt Terry A Kozlowski

44 SMW, Ellsworth Crew R-081: MCCC 1Lt Richard E Benson, **Crew E-113:** DMCCC 2Lt Robert B Morton

321 SMW, Grand Forks Crew: Capt John R Sanders Jr, DMCCC 1Lt James F Garcia

381 SMW, McConnell Crew E-011: MCCC Capt Leonard W Swanson, DMCCC 2Lt Johnny H Ramsey, MSAT Sgt Alex Jahay, MFT Sgt Robert G Bencsko

351 SMW, Whiteman Crew S-223: MCCC 1Lt Steven P Hebert, DMCCC 2Lt Mark B Jackson

308 SMW, Little Rock Crew E-049: MCCC Capt Robert T Costello, DMCCC 2Lt William P Donaldson, MSAT SrA Michael A Long, MFT SrA John D Teeman

The SAC Safety Screen is an honor roll of SAC's most professional crews. To gain listing on the Screen, crew members must be nominated by their unit commanders and meet high selection criteria of experience in their aircraft or missile system *IAW SACR 127-2*.

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FLARE

HALL OF FAME

TACTICAL FLYING

OVER TWENTY-FIVE YEARS	
170 AREFG, McGuire (NJANG)	Feb '56
OVER TWENTY-THREE YEARS	
171 AREFW, Greater Pittsburgh (PAANG)	Mar '58
157 AREFG, Pease (NHANG)	June '58
OVER TWENTY-TWO YEARS	
940 AREFG, Mather (USAFR)	May '59
307 AREFG, Travis	Sep '59
OVER TWENTY YEARS	
151 AREFG, Salt Lake City (UTANG)	Feb '61
161 AREFG, Sky Harbor (AZANG)	Apr '61
126 AREFW, Chicago O'Hare (ILANG)	Apr '61
134 AREFG, McGhee Tyson (TNANG)	Aug '61
OVER NINETEEN YEARS	
11 SG, Fairford	Feb '62
340 AREFG, Altus	Jun '62
96 BMW, Dyess	Aug '62
OVER EIGHTEEN YEARS	
19 BMW, Robins	Aug '63
OVER SIXTEEN YEARS	
160 AREFG, Rickenbacker (OHANG)	Dec '64
320 BMW, Mather	Jul '65
OVER FIFTEEN YEARS	
452 AREFW, March (USAFR)	Sep '66
OVER FOURTEEN YEARS	
92 BMW, Fairchild	Feb '67
55 SRW, Offutt	Jul '67
2 BMW, Barksdale	Aug '67
OVER TWELVE YEARS	
5 BMW, Minot	Feb '69
42 BMW, Loring	Sep '69
141 AREFW, Fairchild (WAANG)	Oct '69
OVER ELEVEN YEARS	
28 BMW, Ellsworth	May '70
OVER NINE YEARS	
101 AREFW, Bangor (MEANG)	Mar '72
306 SW, Mildenhall	Apr '72
416 BMW, Griffiss	May '72
305 AREFW, Grissom	Aug '72
OVER EIGHT YEARS	
379 BMW, Wurtsmith	Apr '73
OVER SEVEN YEARS	
931 AREFG, Grissom (USAFR)	Feb '74
384 AREFW, McConnell	Mar '74
189 AREFG, Little Rock (ARANG)	May '74
OVER SIX YEARS	
43 SW, Andersen	Dec '74
68 BMW, Seymour Johnson	Sep '75
OVER FOUR YEARS	
410 BMW, K.I. Sawyer	Apr '77
190 AREFG Forbes (KSANG)	Apr '77
128 AREFG Milwaukee (WIANG)	Jul '77

ICBM

OVER SEVENTEEN YEARS	
1 STRAD, Vandenberg	Sep '64
OVER ELEVEN YEARS	
341 SMW, Malmstrom	Apr '70
OVER EIGHT YEARS	
390 SMW, Davis-Monthan	Jul '73
OVER SEVEN YEARS	
351 SMW, Whiteman	Oct '74
OVER SIX YEARS	
91 SMW, Minot	Nov '74
OVER FIVE YEARS	
321 SMW, Grand Forks	Feb. '76

To gain listing in the Hall of Fame, a SAC or ARF unit must be Class A mishap-free for 48 months.

*U.S. Government Printing Office
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